REMARKS

Claims 1-22 are pending. The Applicant seeks to amend claim 1. The offered amendments are to more clearly define the claimed invention, and place the case in condition for allowance. Alternatively, the offered amendments present the rejected claims in better form for consideration on appeal. Therefore, it is appropriate that the Examiner enter all the offered amendments into this application at this time. Rule 116(a); MPEP 714.12, 714.13. Reconsideration of this application, and allowance of all pending claims is respectfully requested.

As a preliminary matter, the Applicant respectfully requests that the Examiner reconsider the finality of his office action. The basis for the final rejection provided by the Examiner is that the previous amendments filed on February 9, 2004 necessitated new grounds of rejection. However, the Applicant respectfully disagrees and requests the Examiner to reconsider the three points enumerated herein, which were previously of record. In addition, the record shows that not only does Ozeki fail to disclose or suggest the use of a scattering medium, Ozeki actually teaches away from the use of a scattering medium by disclosing convergence of propagating light so as to maintain sufficient light intensity. The use of a scattering medium would inhibit the Ozeki's convergence of light.

Regarding Finality of Office Action

The **first point** that the Applicant wishes the Examiner to consider, is that the Examiner has correctly stated that the primary reference Ozeki fails to disclose a "scattering medium" as recited each of the Applicant's original claims (in both Office Actions of record). However, the Examiner suggests that Figure 3 of Ozeki shows the optical signals scattered, because the signals are transmitted in different directions. Based on this, the Examiner concludes that it would have been obvious to include a "scattering medium" in the Ozeki optical bus system.

As such, the **second point** that the Applicant wishes the Examiner to consider, is that one skilled in the art would not understand the normal propagation of light rays as shown in Ozeki's Figure 3 to imply or otherwise suggest a scattering medium. Scattering is a well-defined term of art. Scattering is the change of direction of light rays after striking small particles. Said in another way, scattering is the diversion of a light ray from its original path as a result of

collisions with particles in the medium between the source of the light ray and a point at some distance away. A search of any technical glossary online or in print will confirm this general definition.

In contrast to the Applicant's claimed limitation of a "scattering medium", Ozeki shows the normal propagation of light rays from the source and uniform reflection off of reflecting layer 62. Significantly, and as explained in the Applicant's previous response, there are no collisions with a scattering medium during propagation between Ozeki's emitters and receivers or reflectors. Nor is there a suggestion as to why a scattering medium would be needed or how it would be implemented. For instance, in order for Ozeki to imply or suggest a "scattering medium" as claimed by the Applicant, Ozeki would have to show the propagating light rays (arrows in Figure 3) changing directions within the optical bus 20. Simply stated, Ozeki does not disclose or suggest a "scattering medium."

The **third point** the Applicant kindly requests the Examiner to consider is related to the second point and is this: even if the different directions shown by the arrows in Ozeki's Figure 3 were indicative of scattering, the mechanism that caused that scattering would be included in Ozeki's emitters or in Ozeki's reflecting layer 62, and not included in Ozeki's optical bus. As explained in the Applicant's previous response, an emitter scattering mechanism is distinct from a scattering medium included in the optical bus. In support of this point, note that the Applicant's dependent claim 3 defines the emitter as including a "scattering grating" for redirecting the emitted radiation laterally through said shared waveguide. Likewise, the Applicant's dependent claim 17 defines the waveguide as including a "reflective medium" for containing the scattering radiation.

Thus, based on the patent rules of claim differentiation, the Applicant's originally claimed limitation of a "scattering medium" (claim 1) has to be distinct from the also originally claimed limitations of a "scattering grating" of the emitter (claim 3) and a "reflective medium" of the waveguide (claim 17). Said differently, the "scattering grating" and the "reflective medium" limitations of the dependent claims 3 and 17 are in addition to the "scattering medium" limitation of the independent claim 1.

Because the Applicant's original claims all recite the limitation of a "scattering medium", the Applicant submits that the previous amendment did not necessitate the new grounds for rejection as stated by the Examiner. Rather, and as stated in that previous response, the claim language "configured with dispersive particles" was added by the last amendment to expressly state that which was already inherent in the claimed phrase "scattering medium." In short, a scattering medium by definition is known to have dispersive particles. Thus, the Applicant respectfully submits that the previous amendments should not have necessitated a new grounds of rejection.

MPEP § 706.07 states that the "applicant who is seeking to define his or her invention in claims that will give him or her the patent protection to which he or she is justly entitled should receive the cooperation of the examiner to that end, and not be prematurely cut off in the prosecution of his or her application." In the spirit reflected here, and in Rule 116(a) and MPEP §§ 714.12, 714.13, the Applicant kindly requests the Examiner to withdraw finality, and fully consider this response.

The Examiner noted that the Applicant's specification contained no disclosure for Figure 10. The Applicant has amended the specification accordingly to include a description of Figure 10, and further notes that the added description is fully supported in the originally filed application (see, for example, pg. 3, lines 15-21; pg. 5, lines 19-20; pg. 6, lines 14-21; pg. 10, lines 3-10; and Figures 5-9).

Claims 1, 10, 11, 12, 15, 16, 21, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki (U.S. Patent No. 6,317,242) in further view of Stine (U.S. Patent No. 4,720,706).

The Applicant traverses this rejection.

As a preliminary matter, the Applicant does not concede that Ozeki has a priority date prior to the Applicant's date of invention. However, in order to move this case to allowance, the Applicant will now discuss the deficiencies associated with Ozeki, as well as those associated with Stine.

In order for the cited references to render the claimed invention unpatentable, the references as a whole must disclose or otherwise suggest each and every limitation recited in the claims. MPEP § 2143. The Applicant respectfully submits that neither Ozeki or Stine, or their combination, satisfy this standard.

The Applicant's claim 1 recites, in part: "An intra chip or intra multi-chip module on a shared substrate multi-wavelength optical communication system comprising: ... a shared waveguide ... including a scattering medium configured with dispersive particles for transmitting emitted radiation to said detectors. In addition, the independent claims 21 and 22 each define, in part: "A multi-wavelength optical communication system comprising: ... a shared waveguide for transmitting radiation from the emitters to the detectors, the waveguide including a scattering medium configured with dispersive particles."

Thus, the claimed invention is limited to having a waveguide that includes a scattering medium configured with dispersive particles. Recall that this "scattering medium" included in the waveguide is distinct from scattering mechanisms included in the emitters, and from reflective mediums for containing the scattering radiation. For example, a scattering mechanism included in the emitters is defined in dependent claim 3 ("scattering grating"), and a "reflective medium" is defined in dependent claim 17.

Ozeki

As correctly noted by the Examiner, Ozeki fails to disclose a waveguide including a "scattering medium" as recited in the Applicant's claims. In effort to correct this deficiency, the Examiner suggests that Figure 3 of Ozeki shows optical signals being transmitted in different directions, and states that it would have been obvious to include a scattering medium in the Ozeki optical bus system.

As explained herein, as well as in the Applicant's previous response, Ozeki's Figure 3 merely shows the normal propagation of light rays from the emitting source, and then uniform reflection off of reflecting layer 62. However, there are no collisions with a scattering medium during propagation between Ozeki's emitters and receivers or reflectors. In particular, Ozeki fails to show the propagating light rays (arrows) changing directions within the optical bus 20. Rather, the rays demonstrated by Ozeki simply stay on their original path until they reflect of reflecting layer 62. Simply stated, Ozeki does not disclose or suggest a "scattering medium" as

that term is known in the art, let alone why a scattering medium would be needed or otherwise beneficial or how it would be implemented.

Ozeki Teaches Away from Claimed Invention

Indeed, Ozeki's Figure 3 is actually teaching away from scattering. In particular, Ozeki discloses: "The edges of the optical bus 60 are each formed in a concave fashion so as to converge light" (col. 8, lines 50-52; Figure 3). Significantly, the use of a scattering medium would prevent Ozeki's disclosed convergence of light. In particular, scattering of light throughout the optical bus is essentially the opposite of converging light toward a particular node.

In more detail, Ozeki discloses that signal light components 50a and 50b are emitted from input nodes A and C. The signal light components 50a and 50b then propagate through the optical bus 60 to reach the light output nodes D, E and F. The light components 50a and 50b are then reflected simultaneously by the reflecting layer 61, and travel back in the opposite direction to node B for light output (col. 8, line 66 to col. 9, line 9). Ozeki further discloses: "Since the optical bus 60 has concave-shaped edges for converging light, any drop in light intensity resulting from the double diffusion of the signal light components 50a and 50b inside the bus is minimized; the components 50a and 50b are converged efficiently onto the output node B. In this manner, signal light is sent out from one bus edge to the other and back while a sufficiently high intensity level is maintained" (col. 9, lines 9-16).

Thus, Ozeki attributes convergence of light to a particular node with maintaining sufficient intensity level. To add a scattering medium to Ozeki, as suggested by the Examiner, would prevent convergence. Furthermore, note Ozeki's use of the phrase "double diffusion" (col. 9, line 11), which indicates that the emitted light rays only travel on two original paths - the first path (where the light ray components 50a and 50b travel or "diffuse" from the left side of the optical bus 60 to the right side), and the second path (where the light ray components 50a and 50b travel or "diffuse" from the right side of the optical bus 60 back to the left side). Such "double diffusion" would not be possible with a scattering medium in place, because each light ray would diffuse in a new direction each time it collided with a particle in the scattering medium.

For at least these reasons, the Applicant maintains the position that Ozeki fails to disclose

or suggest a scattering medium, and that Ozeki actually teaches away from the Applicant's claimed invention. Therefore, and with Ozeki's disclosure of convergence and "double diffusion" in mind, the Applicant respectfully requests the Examiner reconsider and withdraw his statement that it would have been obvious to include a scattering medium in the Ozeki optical bus system.

Stine

The Examiner also cites the new reference Stine to remedy the deficiencies of Ozeki. However, the Applicant submits that the combination of Ozeki and Stine is improper in that, when taken as a whole, there is no motivation or suggestion to combine these references to achieve the Applicant's claimed invention. Section 2143.01 of the MPEP states: "The mere fact that references can be combined or modified is not sufficient to establish prima facie obviousness." In addition, the "level of skill in the art cannot be relied upon to provide the suggestion to combine references."

Rather, there must be some objective reason to combine the teachings of the references to make the claimed invention. The Applicant cannot find such an objective reason, and the Examiner has provided no reason other than ordinary skill in the art, in conjunction with the dispersing capability of a scattering medium. To the contrary, the Applicant respectfully submits that Ozeki actually discourages a combination with Stine by teaching convergence of optical signals, and not scattering. In addition, the Applicant respectfully submits that there is no objective reason to make this combination without first having some knowledge of the Applicant's claimed invention.

As explained herein, Ozeki does not disclose or suggest a scattering medium. Rather, Ozeki teaches away from the claimed invention by disclosing double diffusion and convergence in the name of maintaining light intensity at sufficient levels.

Stine discloses a display device that converts incoming electrical RGB signals into optical hues (col. 4, lines 15-18). The hues are caused to instantly disperse throughout a radiation confining region using a "ganzfeld distributor." This distributor is configured to contain the "ganzfeld radiation" in a unique form, such that the established field is uniform as to hue and field strength (col. 4, lines 29-38). Stine further disclosure that the "ganzfeld distributor function may be enabled through passive optical elements known in the art, with the transmissive

containment region being hollow, fluid filled (gas or liquid), solid, granular, or a heterogeneous composite of the foregoing" (col. 4, lines 48-53; Figures 1 and 8-10). Significantly, Stine further explains the "*unique*" form of this radiation: "This ganzfeld radiation *possesses no discrete beam* and permeates the three-dimensional ganzfeld region as a radiant and uniformly perceived hue having uniform intensity throughout" (col. 4, lines 34 and 42-45; italics added for emphasis). The established ganzfeld radiation is then used to totally and uniformly transilluminate the imaging screen's 21 input surface, which consists of a transmissive polarizer. The output surface of the imaging screen 21 consists of a like polarizer oriented orthogonally to the input polarizer such that one polarizer may pass only vertically polarized light while the other may pass only horizontally polarized light (col. 4, lines 54-65).

Thus, Stine's distributor operates to generate a radiant and uniformly perceived hue having uniform intensity throughout. The output of the distributor is then applied to an imaging screen that polarizes the hue. Note that there are no detectors on the output of the Stine's distributor. Rather, the detectors are provided after the output of the imaging screen, where the light has been polarized (as opposed to scattered).

With Ozeki and Stine in mind, the Applicant can see no reason why one skilled in the art would be motivated to use Stine's ganzfeld distributor (without the imaging screen and polarizer) in conjunction with Ozeki's optical bus. To do so would require to reader to ignore Ozeki's disclosure as to double diffusion and convergence. It would also require the reader to ignore Stine's disclosure that the "ganzfeld radiation possesses no discrete beam ... ." It would also require the reader to ignore the horizontal and vertical polarization included in the imaging screen disclosed by Stine. Such selective picking from one disclosure to remedy deficiencies of another seems to be based in hindsight reasoning drawn from the Applicant's claims, and therefore improper. The MPEP §2141.02 states that references must be considered in their entirety, including disclosure that teaches away from the claimed invention. For at least these reasons, the Applicant respectfully submits that the requisite motivation to combine or modify is lacking.

Even if there was motivation to do so, note that modifying Ozeki by Stine would defeat the intended operation of Ozeki and would require a substantial reconstruction and redesign of the optical bus disclosed by Ozeki. In particular, Ozeki states that components 50a and 50b are

converged efficiently onto the output node B, so as to maintain sufficiently high intensity levels (e.g., col. 9, lines 9-16). Ozeki also refers to "double diffusion" thereby further indicating a single undisturbed outgoing diffusion path, and a single undisturbed return diffusion path as previously explained. In contrast, Stine uses a distributor. Simply stated, including a distributor in the Ozeki design would prevent signal convergence on node B. This modification of Ozeki further assumes that Stine's distributor would operate to provide each discrete wavelength of light to each of the detectors, despite Stine's disclosure that the distributor output "possesses no discrete beam."

The Applicant therefore respectfully submits that to include the distributor of Stine in Ozeki's optical bus would "require a change in the basic principle" under which the Ozeki construction was designed to operate (to cause double diffusion propagation with minimal loss of intensity). Such a combination therefore appears to be in contradiction to MPEP § 2143.01, which states that a proposed modification cannot change the principle of operation of a reference. In this particular case, the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [Ozeki] as well as a change in the basic principle under which the [Ozeki] construction was designed to operate." MPEP § 2143.01 Thus, the Applicant respectfully submits the combination is improper.

For at least these reasons, the Applicants respectfully submit that neither Ozeki or Stine or their combination disclose or suggest the claimed invention as recited in claims 1-22. Thus, the Applicant respectfully requests that this rejection be withdrawn.

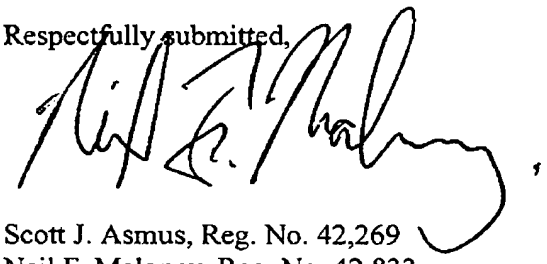
Claims 2-9 and 13-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozeki in view of Stine in further view of Frankel (U.S. Patent No. 6,096,496).

As previously explained in the Applicant's previous response, Frankel also fails to disclose or suggest a shared waveguide operatively coupled between emitters and receivers, wherein the waveguide includes a scattering medium as recited in the Applicants' claims 1-22. Thus, none of Ozeki, Stine, Frankel, or any combination thereof, disclose or suggest each and every limitation of the Applicant's claimed invention. Moreover, the requisite suggestion or motivation to combine Ozeki, Stine and Frankel to achieve the Applicant's claimed invention is lacking for at least the reasons explained herein.

As such, the Applicant respectfully requests the Examiner to reconsider and withdraw this rejection.

The Applicant believes the above amendments and remarks to be fully responsive, thereby placing this application in condition for allowance. Favorable action is solicited. The Examiner is kindly invited to contact the undersigned attorney by telephone, facsimile, or email for quickest resolution, if there are any remaining issues.

Respectfully submitted,



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